MANAGEMENT OF FRACTURE TIBIA WITH CLOSED INTERLOCKING NAILING VERSUS V-NAILING

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ABSTRACT

BACKGROUND

Tibial shaft fracture is the most common type of long bone fracture. The most common cause of fracture shaft tibia is vehicular accident followed by fall. Severe complications and major disabilities are common outcome of this fracture.

The aim of this study is to compare results of interlocking nailing and V nailing for the management of tibial fractures.

MATERIALS AND METHODS

A prospective study had been conducted at S.R.T.R. Govt. Medical College, Ambajogai, Maharashtra State, from Jan 2011 to Dec 2014. Twenty eight patients of closed or Grade 1 compound fracture tibia who underwent fixation by interlocking or V nail were included in this study. Patient was evaluated completely in the form of history, clinical and radiological evaluation.

RESULTS

All the fractures united with union time ranging from 12 weeks to 28 weeks. In majority cases, mode of injury was vehicular accident. None of the patients developed complications like hardware breakdown, patellar tendinitis, deep infection and non-union.

CONCLUSION

The results obtained in this study have shown that though V nailing is an easy economic method of fixation of fracture tibia, but it is associated with complications as compared to interlocking nailing.

KEYWORDS

Tibia, Intramedullary, Interlocking, V Nail.


BACKGROUND

Tibial shaft fracture is the most common type of long bone fracture. Severe complications and major disabilities are common outcome of this fracture, because of its subcutaneous location and poor blood supply.

Various operative and non-operative modalities for treatment are evolved. Plate osteosynthesis for fracture of the distal tibia is often associated with delayed healing, infection and hardware problem.[1-3] Locked intramedullary nailing is the treatment of choice for closed fracture of tibial shaft.[3]

In this study, we are going to compare results of interlocking nailing and V nailing for the management of tibial fractures.

MATERIALS AND METHODS

Prospective study of 28 patients with tibial fractures was conducted during 2011 to 2014 with followup of 12 weeks to 12 months. Inclusion criteria was closed and Grade I compound fracture, while exclusion criteria were compound fracture more than Grade I, paediatric fractures and pathological fracture. The technique adopted was closed intramedullary interlocking nailing and closed intramedullary V nailing [Figure 1, Figure 2].

In present study, 14 patients were treated with interlocking nail and 14 treated with closed V nail. Age distribution in study ranged from 20 to 55 (Mean age 37.5), mode of trauma was vehicular accident. In both groups, half patients were closed and remaining half fractures were grade I compound. Duration of surgery was 1 hour for interlocking and ½ hour for V nailing.

After admission, relevant x-rays including the affected legs with knee and ankle joints antero-posterior and lateral views were taken. Initial management consists of closed reduction and splinting with proper wound care in case of compound fractures. All patients were operated under regional anaesthesia with patient in supine position.

Patellar splitting approach was used in all patients under tourniquet to minimise blood loss. Reduction of fracture was achieved by manual traction, both nailing was done using standard technique.

Radiological evaluation was done with standard antero-posterior and lateral views of tibia with knee and ankle joints. Hip knee mobilisation started on second day in case of interlocking nailing group, while immobilisation continued with below knee slab and below knee plaster after stitch removal in case of V nailing group till callus formation seen on x-ray. After evidence of callus on x-ray, partial weight bearing started. Discharged after stitch removal, usually on 10th post-operative day. Patients were called for 3 weekly followup for clinical and radiological evaluation.
RESULTS
All the fractures united with union time ranging from 12 weeks to 28 weeks. The patients were treated with interlocking nailing showed mean healing time of 16 weeks, while the patient treated with V nail is 20 weeks. Clinical and radiological outcome using Ekeland grading, majority of patients in both series had excellent and good results. Majority of patients regained good range of movement in both ankle and knee. Four of the patients in V nailing group had ankle stiffness, while one patient from interlocking group had knee stiffness. Two patients from V nailing group had superficial infection at insertion site, while two patients from interlocking group developed superficial infection at screw site and insertion site. None of the patients developed complications like hardware breakdown, patellar tendinitis, deep infection and non-union.

DISCUSSION
Tibial shaft fracture is the most common type of long bone fractures. Various operative and non-operative modalities are evolved, but which one is better remain unsolved. Previously, for long duration fracture tibia was treated by closed reduction and immobilisation in plaster results in malunion with addition of joint stiffness. Gerhard Kultscher of Germany in 1940 developed a nail and sparked a new interest in the world of intramedullary nailing.\[4\] Tibial shaft fractures treated with plate osteosynthesis had encountered higher rates of complications, because of which intramedullary interlocking nailing technique is widely preferred for the treatment of tibial fractures.\[5\]

In our study, two techniques of intramedullary fixation analysed by various parameters like union rate, incidence of malalignment, rate of complications and functional outcome using Ekeland grading. In present study, average period of radiological union was found to be 16 weeks for interlocking group and 20 weeks in V nailing group. It has been found that fracture in proximal third required minimal time for union, while segmental fracture took maximum time for union. It was observed that preservation of soft tissue envelope and blood supply surrounding the fracture by using indirect technique would promote fracture healing regardless of type of fixation.\[6\] It has been noted that concurrent fibula fixation in intramedullary interlocking nail will prevent malalignment, but sometimes it affects the fracture union rate and may result in non-union.\[7\]

There were three cases of superficial infection in interlocking group and two cases of superficial infection in V nailing group, which healed with oral antibiotics. One patient had knee stiffness in interlocking group, while four patients of V nailing group had ankle stiffness. Malunion was noted in one case in interlocking group, while three cases in V nailing group. There were two cases of shortening in V nailing group. None of the patients developed complications like hardware failure, deep infection, patellar tendinitis and non-union. In both groups, spontaneous union occurred without any further complications.

CONCLUSION
Management of fracture tibia by closed intramedullary interlocking nail and V nail, both techniques are equally effective when considering union rate and final functional outcome. However, malunion, shortening and stiffness were more frequent after intramedullary V nailing.

REFERENCES